



N inventory sensitivity to organic matter remineralization

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Nitrogen (N) is an essential element for the maintenance of marine biological production. The inventory of marine N is sensitive to the ratio of oxic versus suboxic remineralization of organic matter. Net N loss may occur when significant portions of newly fixed organic material is remineralized under suboxic conditions via denitrification. In the current ocean, this potential N loss is restricted to limited regions. However, numerous climate-sensitive factors that affect the sinking and decay rate of organic matter may impact on the balance between oxic remineralization and suboxic remineralization of organic matter via denitrification and, conditions for net N loss might emerge in the future. Here we use a biogeochemical ocean model, coupled off-line within the Transport Matrix Method (TMM) framework with transport fields taken from the ECCO configuration of the MIT General Circulation Model, to investigate how changes in the depth and rate of remineralization of organic matter affect the ratio of oxic versus suboxic remineralization and impact on the N inventory. We find a high sensitivity of the marine N inventory to changes in the depth remineralization scale and to rates of suboxic remineralization of organic matter.